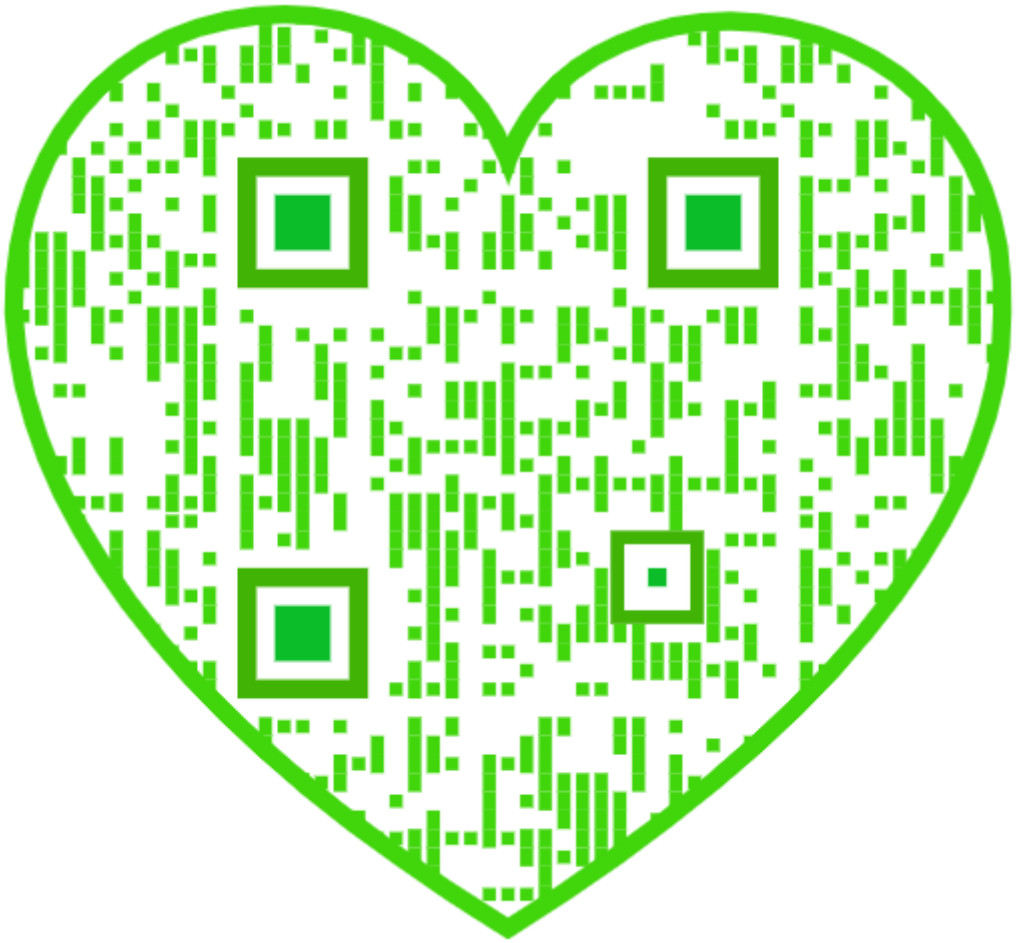
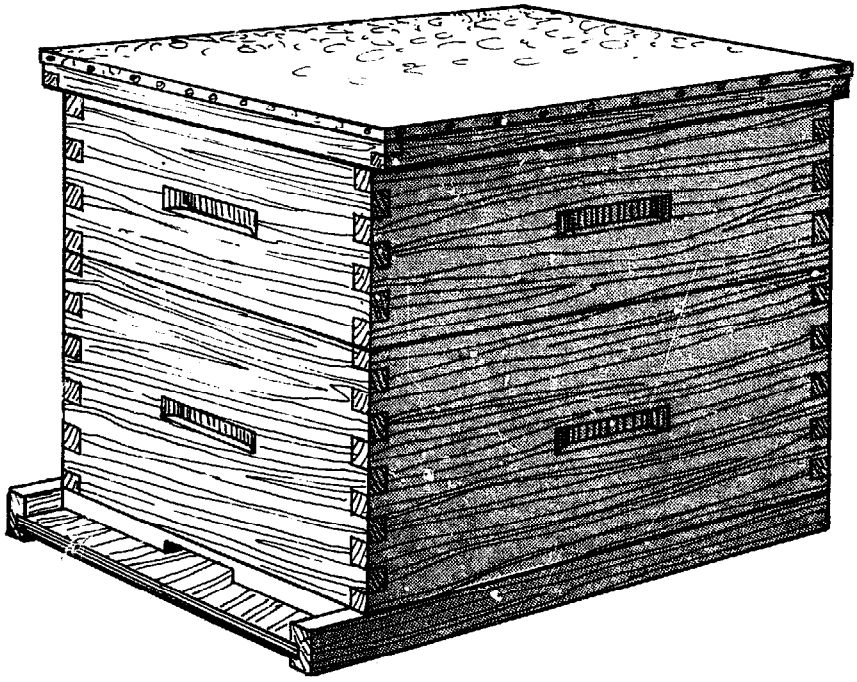


PLANS FOR A

COMPLETE BEEKEEPING SYSTEM



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CHARLOTTE, VT. 05445

BEE SMOKER

Use any can with a tight fitting lid. (canisters from a hardware store make good smokers.) Solder a section of 3/4" tubing, 2½" long through the lid at a 45 degree angle, (not critical) and a section of tube about the same length through the can itself about 3/4" above the bottom with an inch projecting out of the can. Drill two ¼" holes directly above for the 2½ x ¼" bolts as shown.

The front and back of the bellows can be any wood 3/8" thick by 5" x 7½". Drill a 3/8" hole to line up with the tube and holes for ¼" bolts as shown. Cut a section of bed spring and fasten to the same piece with staples. Bolt to can as shown.

Cut vinyl or leatherette 3½" wide and 26" long. Position the bellows front and back as shown in the cross section. (That is 1" apart at bottom and 3½" at top.) Cut this material to fit, overlapping about 1". Glue to blocks, trim with ¼" wide metal strips named with 3/4" nails every inch.

The "Grate" can be made by punching a number of holes in disc of sheet steel cut to fit inside the can. Support with wire legs as shown.

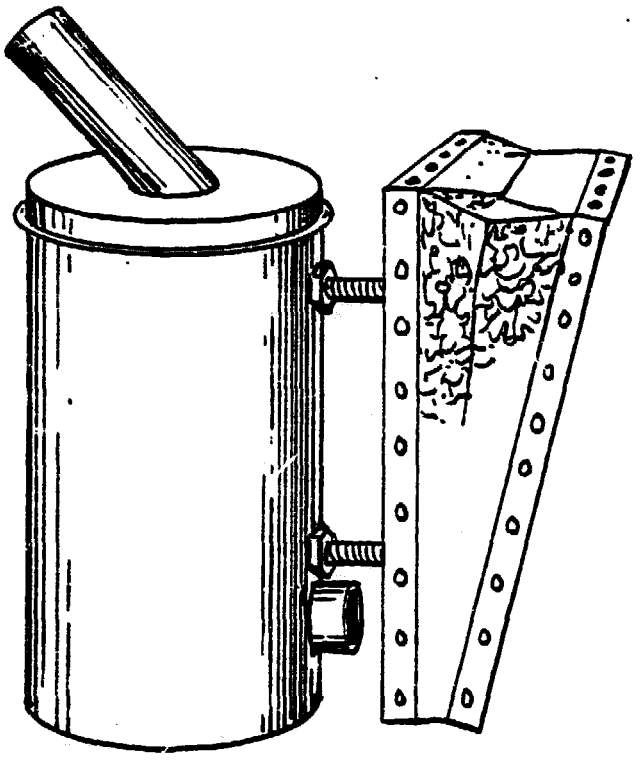
If you choose not to make your own smoker, tney are available in most bee supply catalogs quite inexpensively.

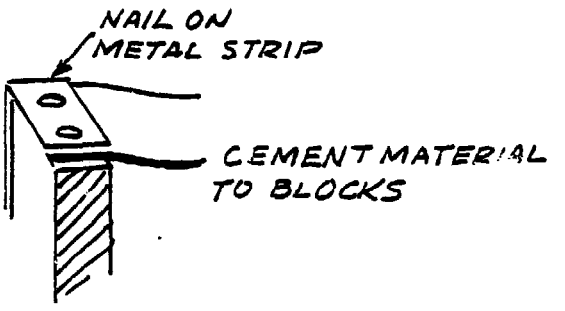
BEE GLOVES

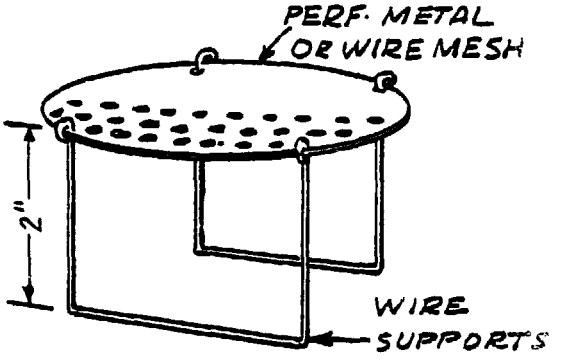
Obtain a pair of comfortable heavy duty cotton gloves and stitch up two loose fitting "sleeves" which will extend about halfway up your forearms. These sleeves should be medium weight canvas, and have elastic sewn into the open end. In use, the "sleeves" should extend over whatever you're wearing (shirt or jacket) and the elastic should be tight enough to be "bee tight".

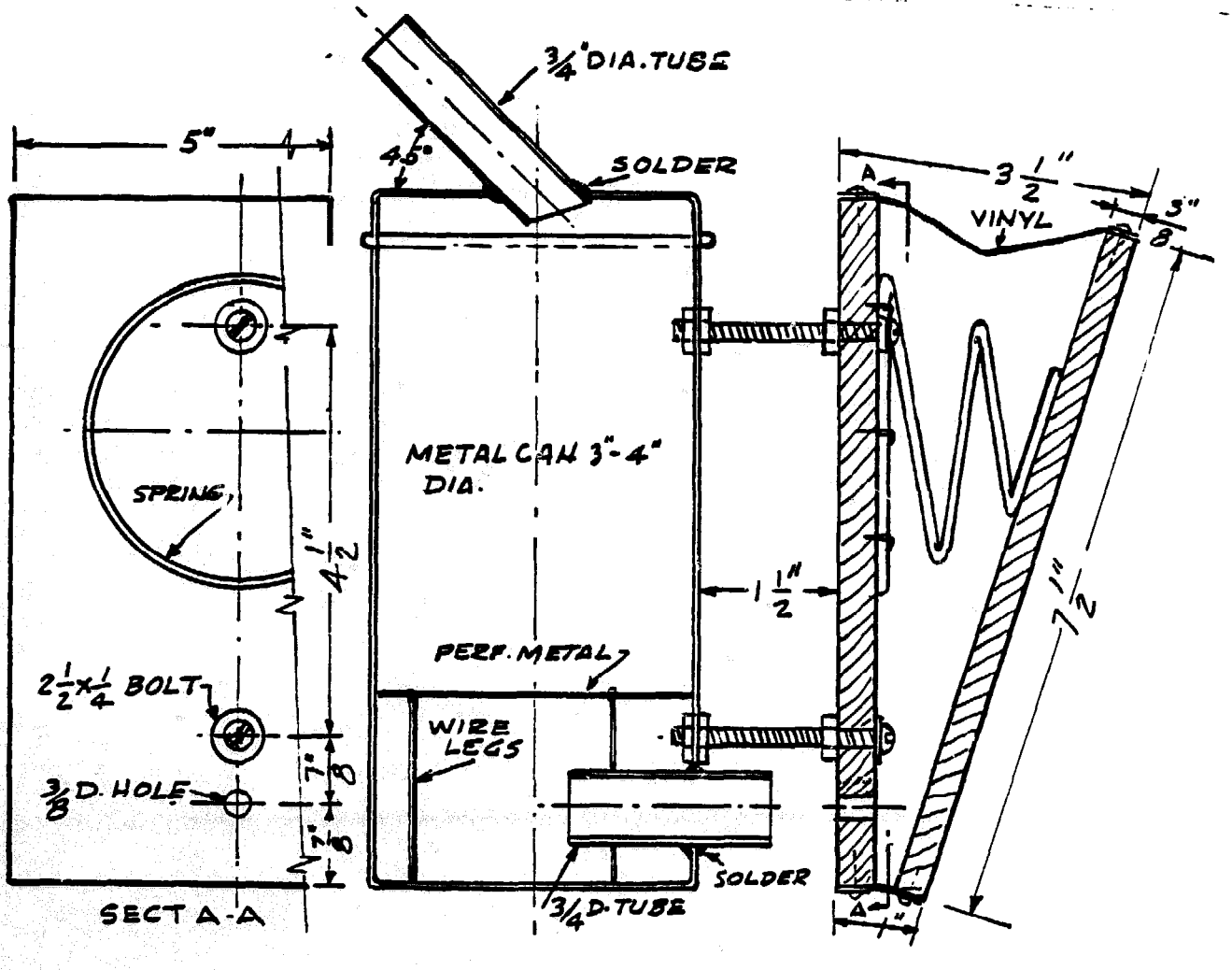
With confidence and experience, you should be able to go without gloves without being stung.

SMOKER.

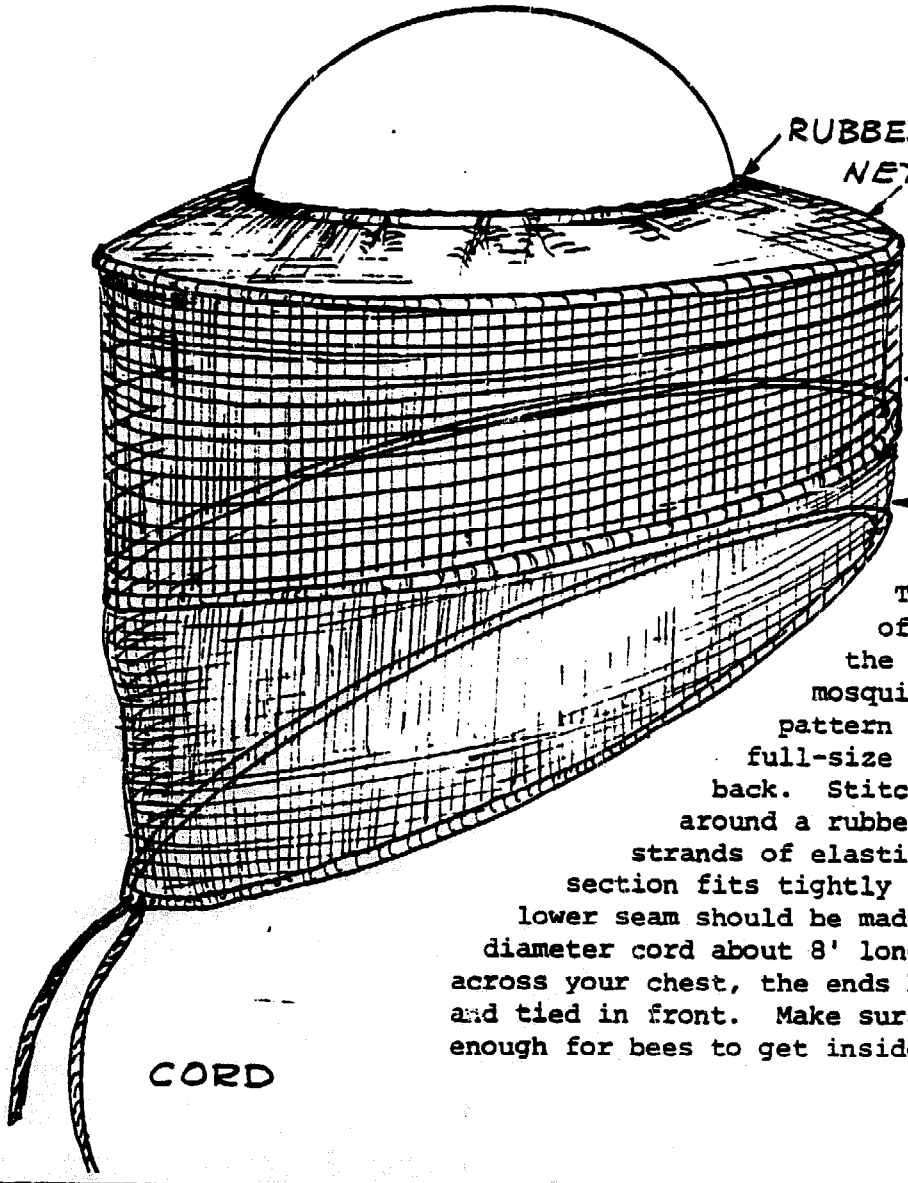



NAIL ON
METAL STRIP
CEMENT MATERIAL
TO BLOCKS

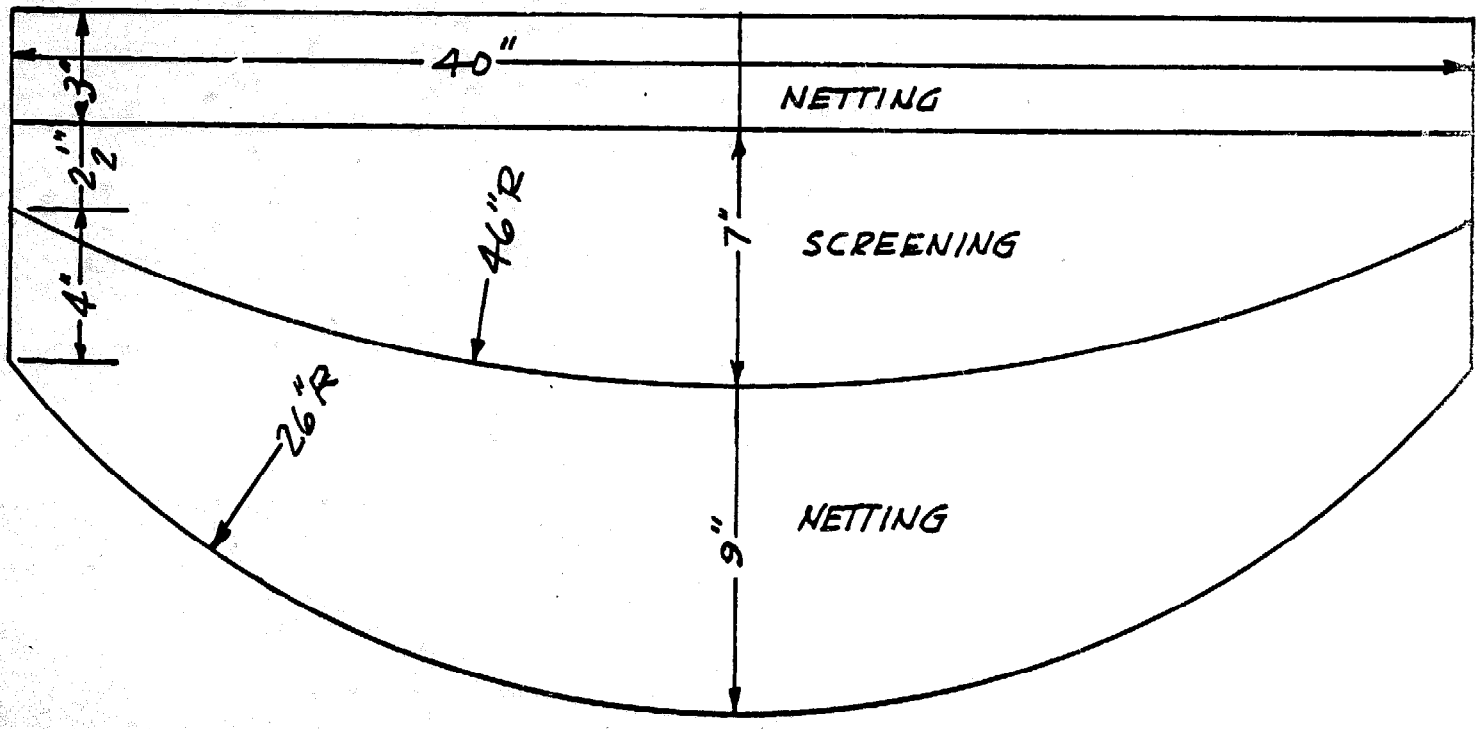

PERF. METAL
OR WIRE MESH
2"
WIRE
SUPPORTS


3/4" DIA. TUBE
5"
45°
SOLDER
3 1/2"
A
VINYL
3"
8
METAL CAN 3"-4"
DIA.
SPRING
1 1/2"
4 1/2
1 1/2"
7 1/2"
PERF. METAL
2 1/2 x 1/4 BOLT
WIRE
LEGS
3/8 D. HOLE
7/8"
7/8"
SOLDER
3/4 D. TUBE
A
1"
SECT A-A

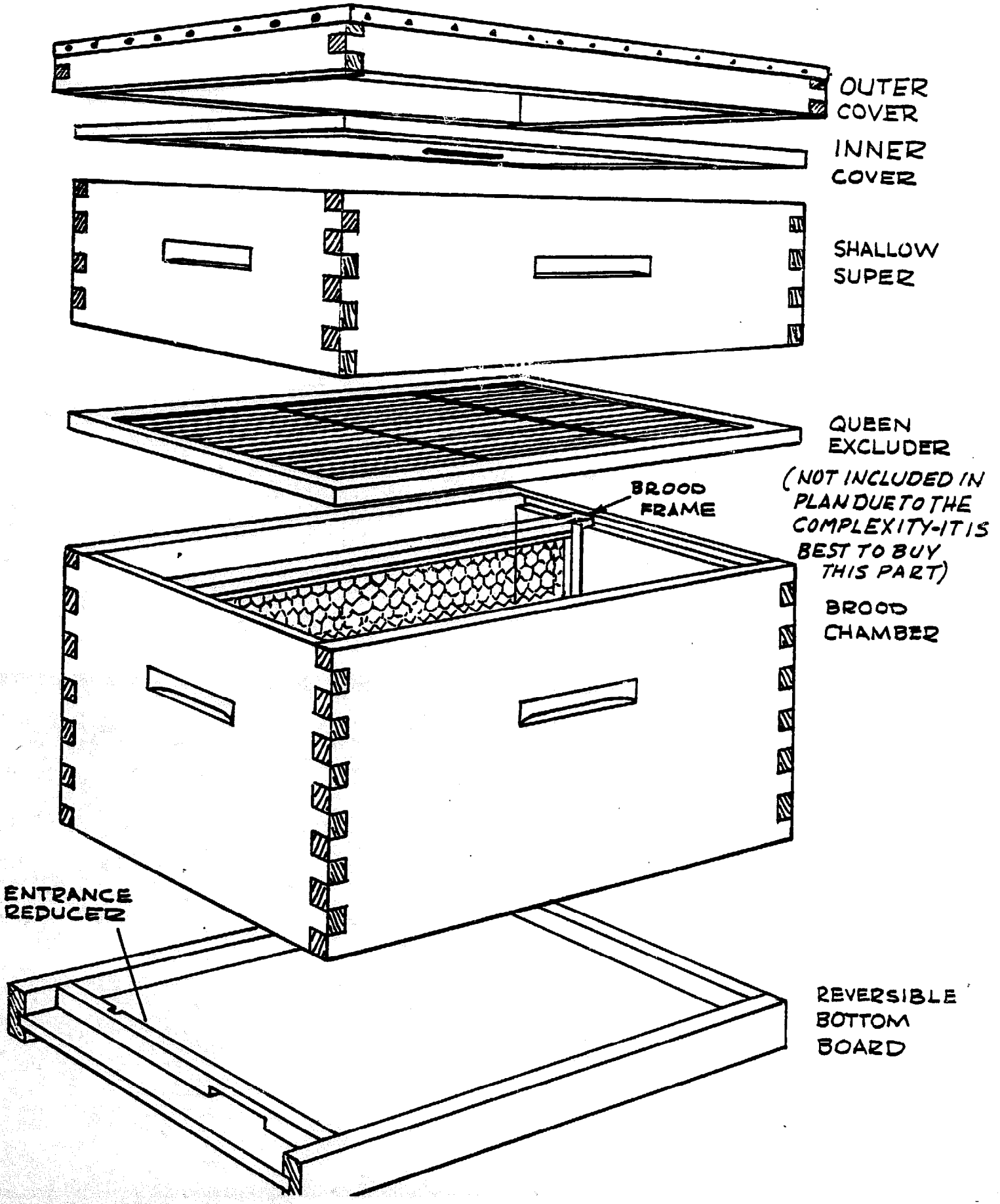
VEIL



The center section is made of plastic window screen and the top and bottom sections of mosquito netting cut to the pattern shown. (For ease, draw full-size pattern.) Sew together in back. Stitch the hat band section around a rubber band or a coil of several strands of elastic cord so that the top section fits tightly around a straw hat. The lower seam should be made wide enough to take a 1/8" diameter cord about 8' long. Cord should be crossed across your chest, the ends brought around your back and tied in front. Make sure there are no spaces large enough for bees to get inside!



COMPONENTS OF A BEE HIVE.



BEE HIVE CONSTRUCTION

Use any 3/4" soft wood such as pine, basswood, or spruce. Three quarter [illegible] exterior grade plywood can be substituted for brood chamber and supers, as [illegible]g as you thoroughly fill and seal all the edges.

NOTE: Dimensions are all quite critical - too little space between frames will keep bees from working efficiently while too much will encourage the bees to fill the space with comb.

BROOD CHAMBER: Finger joints are recommended for strength, although a dado and rabbet joint can be substituted, as well as a simple lap joint, (pg. 5). To make a finger joint, set 3/4" wide dado saw to 3/4" high. Make a cut near the end of a 3/4" board about 3" x 16". Insert a 3/4" x 3/4" x 1½" guide block in this cut (pg. 4) and nail in place. Move board along the face of the miter gauge so the next cut is exactly 3/4" from the guide block. Check for accuracy, and clamp in place on the face plate of the miter gauge. Make the second cut 3/4" x 3/4". This jig is then used to make finger joints. First, stand side on edge touching inside face of guide block (the face nearest the dado blade). Make first cut, then hook this slot over guide block, make next cut and so on. In cutting the opposite end, make sure the notches match. Cut the notches in the side pieces following the same procedure, but make sure that the first cut is made so that when the side and end are assembled, the bottom edge is even. Assemble the frame and mark the top edge of each end in which the 7/16" x 3/4 deep rabbet is to be cut. Note the top "finger" edge of each side runs past the ends to contain the rabbet. Separate, cut rabbets in ends and rip to 9½" width removing stock from bottom edge of brood chamber. Shallow supers are of the same length and width as brood frame, but are only 6" high. Follow same procedure as above for finger joints. NOTE: Since no metal strips are used along rabbet on shallow supers, rabbet is only 5/8" deep. Rip to final width of 5 11/16" removing stock from bottom edge. (Shallow supers are becoming more or less standard, as a deep super full of honey and bees can weigh fifty to sixty pounds. Since these are not too easy to handle, most hobby beekeepers are going to shallow supers. If you want to build deep supers, they are constructed the same way as brood chambers.)

Cut finger grips ½" deep as shown on all four sides. Use aluminum strips or narrow galvanized steel strips in rabbet. These strips allow frames to be removed from the brood chamber far easier.

Nail brood chambers and supers together with galvanized nails.

BOTTOM BOARD: Solid wood can be substituted for plywood. It is important that the 7/8" and 3/8" dimensions be maintained so if a thickness other than 3/8" is used, add the difference to the total width of the sides and end pieces. Nail with galvanized nails, and glue with waterproof glue.

TOP COVER: Finger joints may be cut the same way as the brood chamber, or simple overlapping joints may be substituted. You'll need one piece of pine, 21 3/4" x 5 to 6" wide and one piece 18" x 5½ to 6" wide. (If you decide on a simple overlap joint, the length of the end is only 16½" long.) After finger joints are cut, rip to 2 1/8" width. After the top cover is assembled with glue and nails,

cover with aluminum or galvanized steel, lapping down over the side at least 5/8" to 3/4" to provide a watertight cover.

INNER COVER: Masonite or plywood can be used. The critical dimensions here are the outside dimensions and the 5/16" thickness of the edge strips. Cut hole to accept bee escape. Glue edge strips in place using waterproof glue.

FRAME ENDS: The frame ends must be 1 3/8" wide clear lumber (not a standard thickness.) Dress or have lumber yard dress 2" x 10" lumber, (actual dimension 1½" x 9½") to 1 3/8" thick. Method 1: Cut blocks to lengths shown (9 1/8" or 5 3/8" depending whether you are making brood frames or shallow frames.) (1) Cut 3/4" slots in each end. Make several support blocks from some of the 1 3/8" stock. Width and length are not critical, but the 3/4" x 3/8" tongue should be centered exactly on the 1 3/8" dimension. (2) Secure blocks and clamp assembly in vise or secure to bench top by tacking cleats around the assembly. (3) Remove stock with router as shown in 2. Alternate method: With support block in one end make multiple cuts over dado head to remove the stock. Slice blocks to 5/16" thick and drill 1/8" holes for support wires, and then cut or sand shoulder as shown on full-size patterns. Also smooth any rough areas.

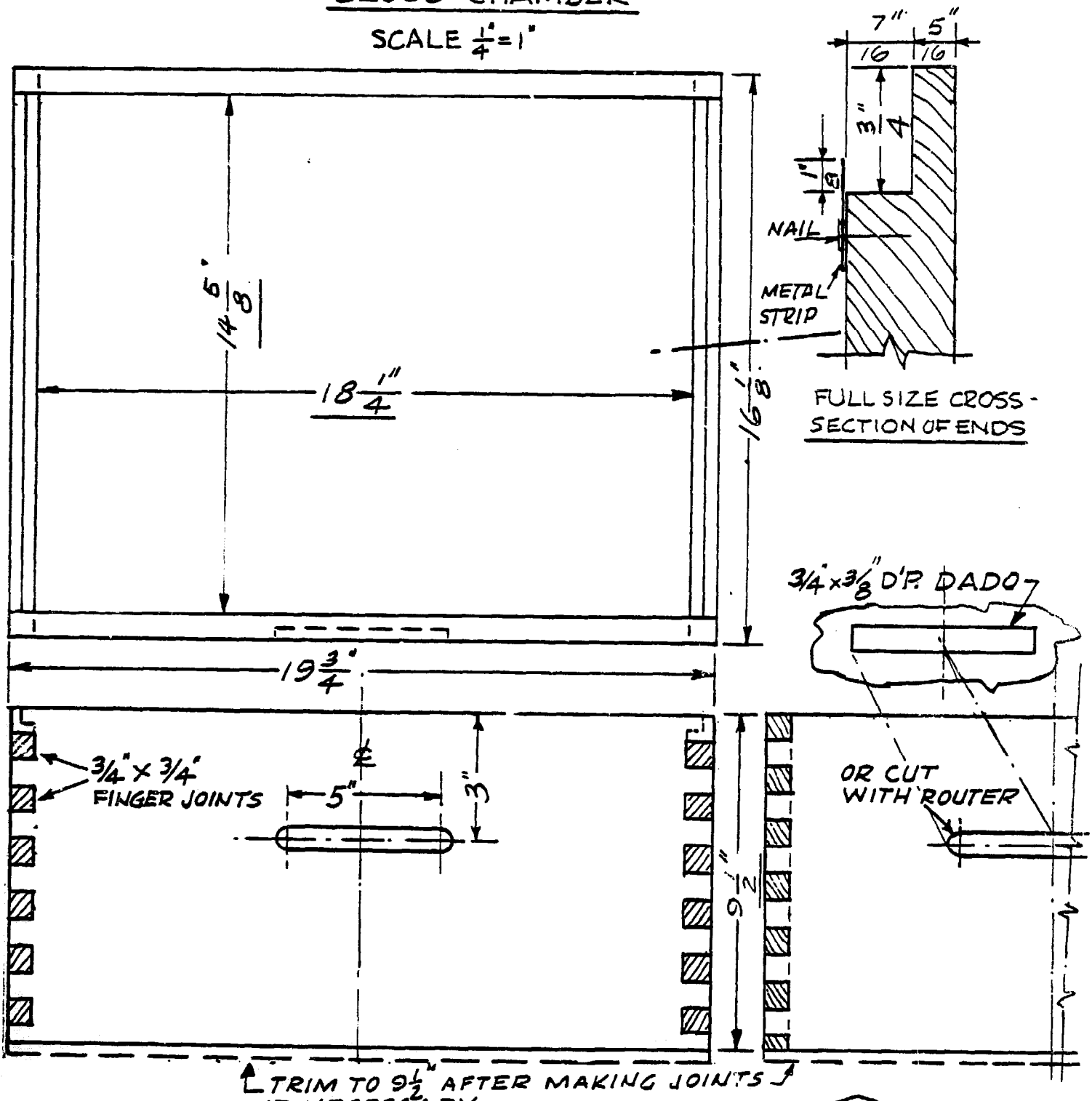
Method 2: Rip 5/16" x 1 3/8" strips and cut to lengths required (either 9 1/8" or 5 3/8"). Stack pieces and clamp together. Cut 3/4" x 3/8" deep slots centered at each end. Using support blocks at each end, follow instructions in step 3 above to reduce the 1 3/8" to the 1 1/8" wide area. Another alternative would be to cut each strip individually on a band saw using a master template.

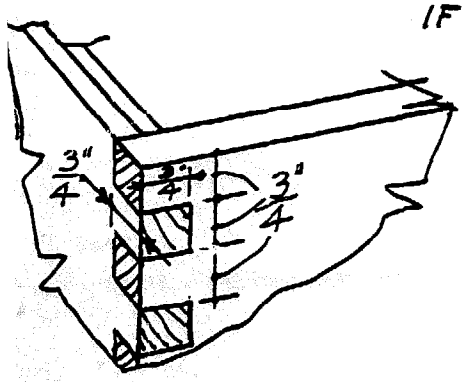
FRAME TOP: Rip stock to 7/8" x 1" dimensions. Cut to 19" length. (1) Cut ½" deep notch 1" from each end. Remove ½" x 1" block either with a wood chisel or by sawing. (2) Cut 5/16" notches for end frames, checking with frame ends for proper fit. (3) Using a saw blade with a thin kerf make two length wise cuts to remove strip as shown in cross section. Save strip to use later for fastening foundation in place.

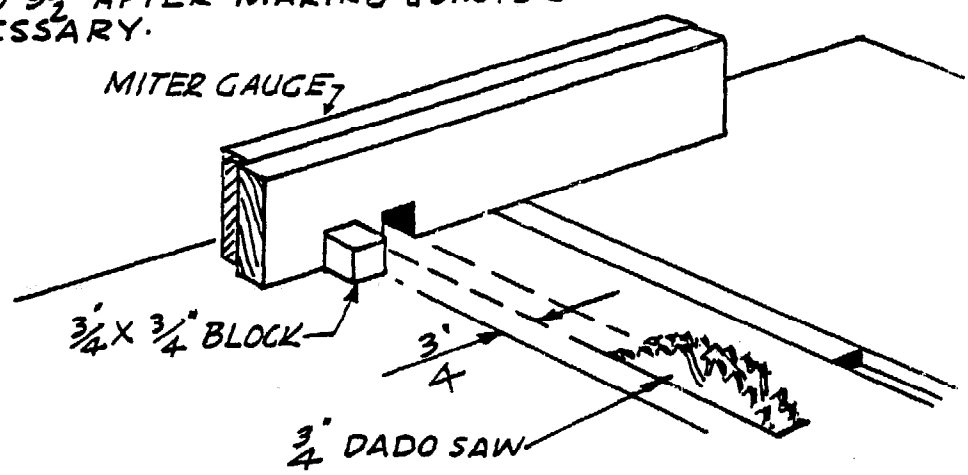
FRAME BOTTOM: Cut strips 17 5/8" x 3/4" as shown. Make a saw cut in center leaving as thin a web as possible. Nail frame ends in place first by driving 1" x 17 or 18 ga. wire nails down through the frame tops in two places at each end. Nail the frame bottoms to the ends with 1" nails. After bottom is nailed in place, thin web is removed with razor blade or sharp knife, or separate two pieces and trim off web before nailing. Foundation is slipped in through the bottom and nailed in place with ½" nails through the piece of stock saved in the FRAME TOP paragraph above.

BROOD CHAMBER

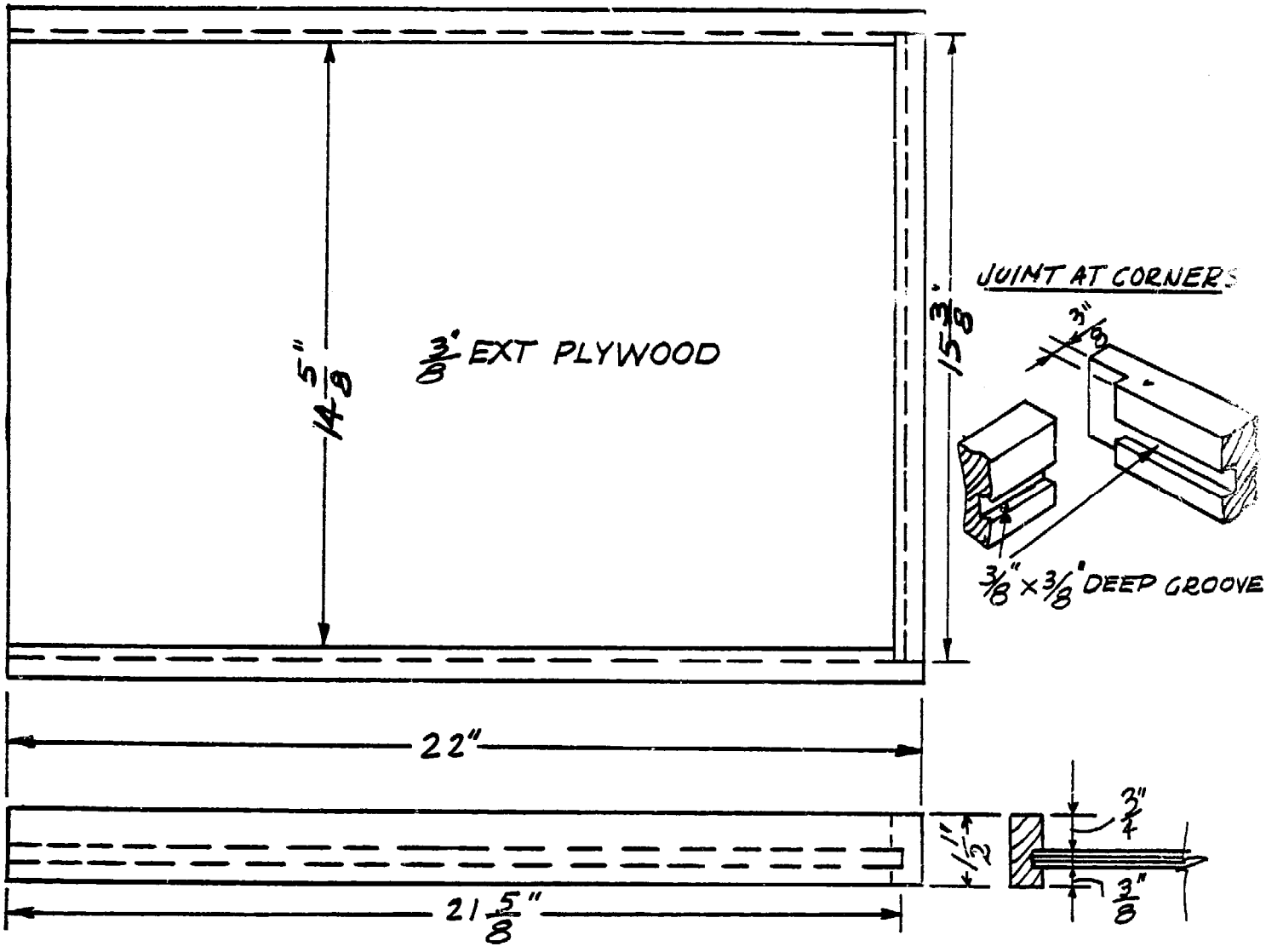
SCALE $\frac{1}{4}$" = 1"



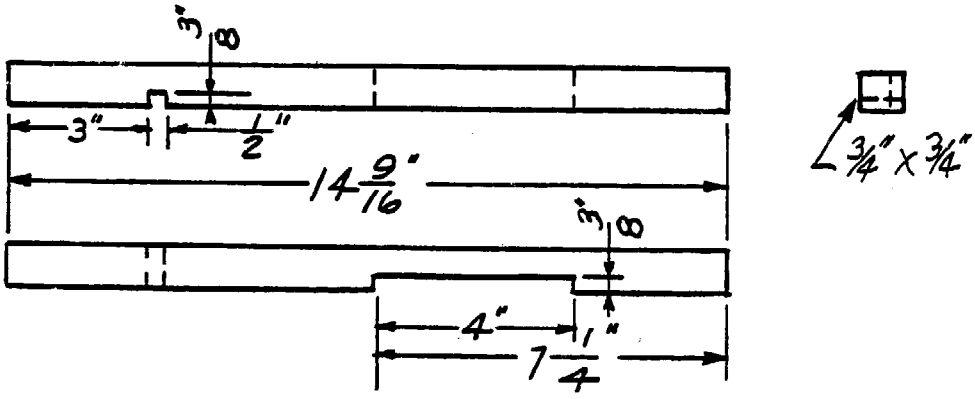




BOTTOM BOARD

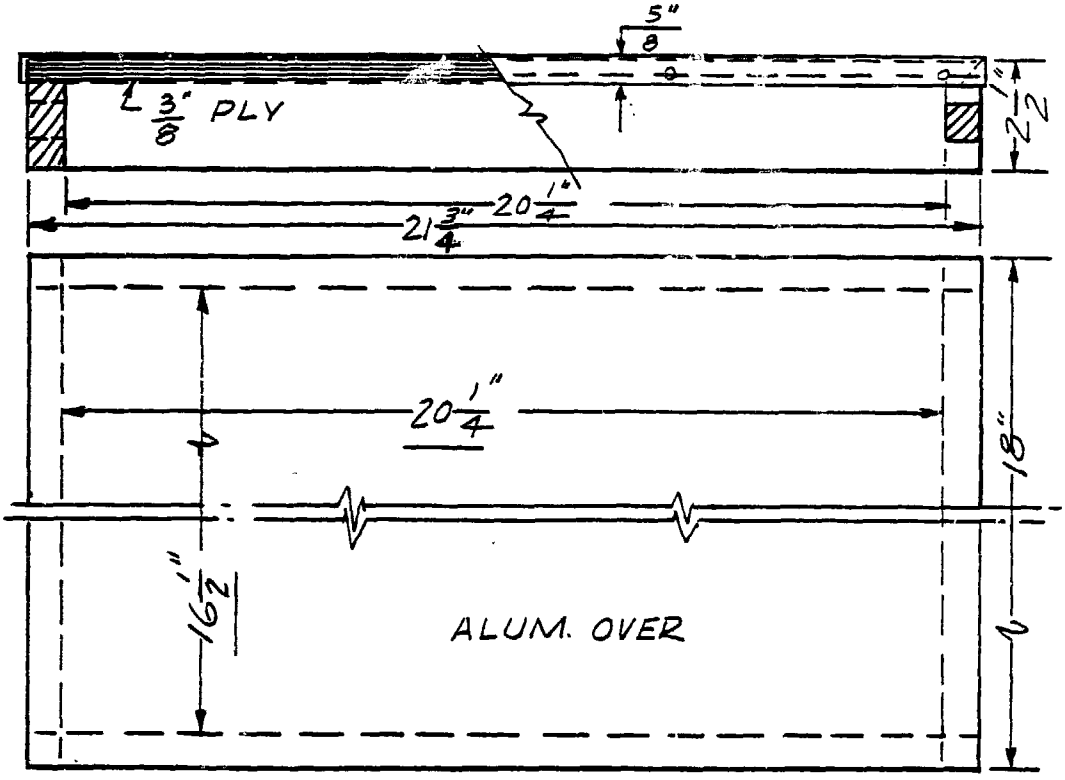


JOINT AT CORNERS

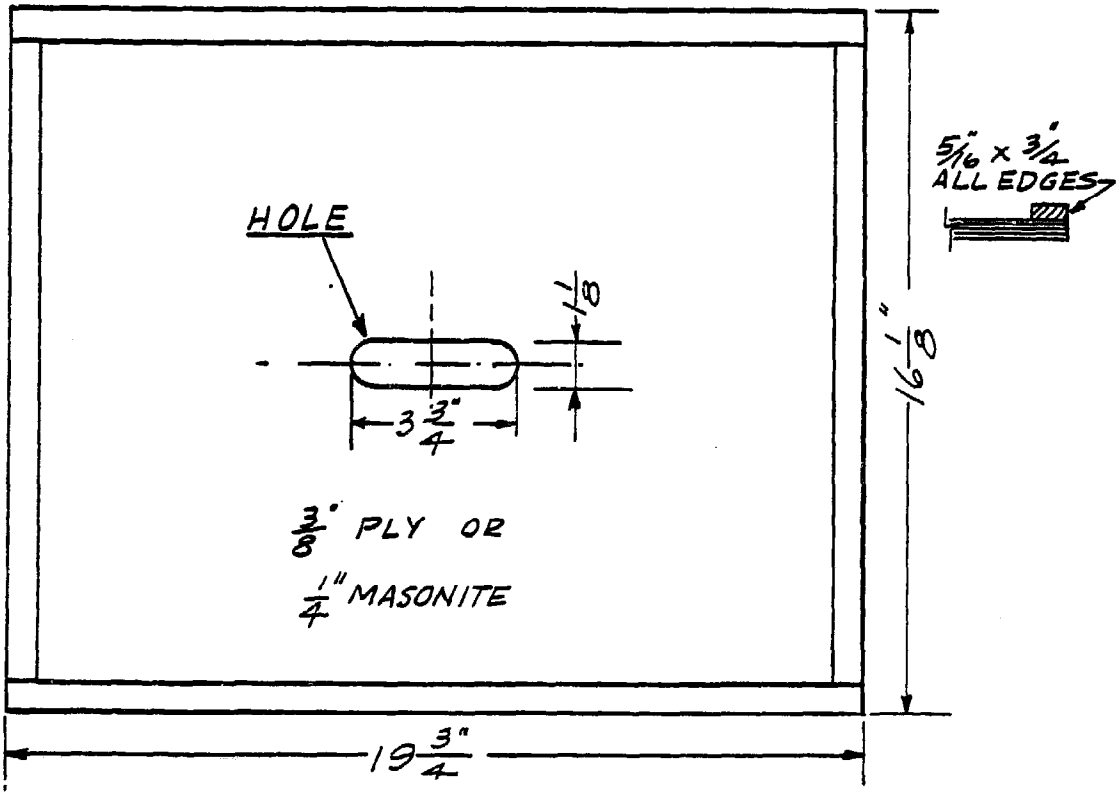


ENTRANCE REDUCER

OUTER COVER

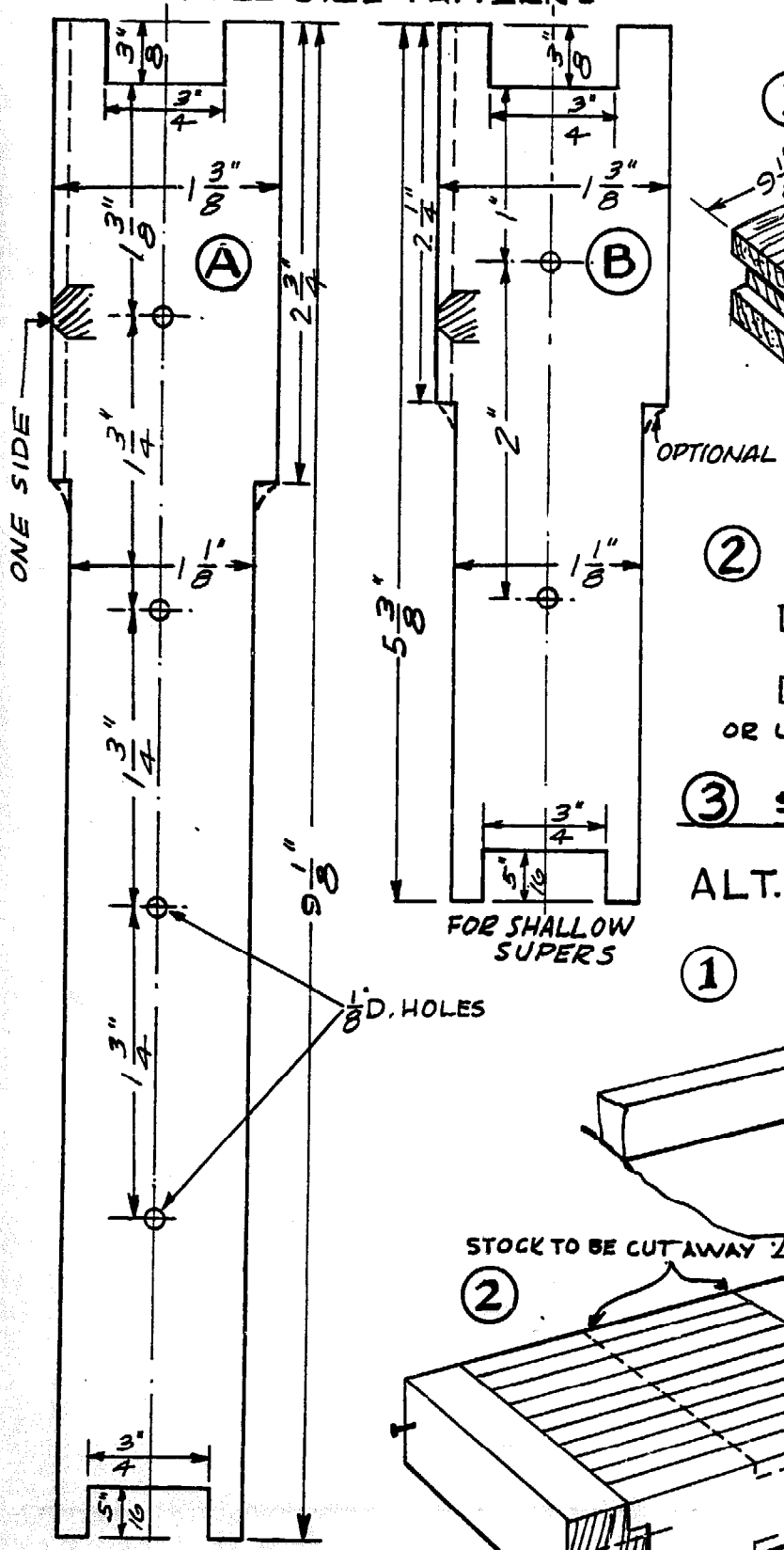


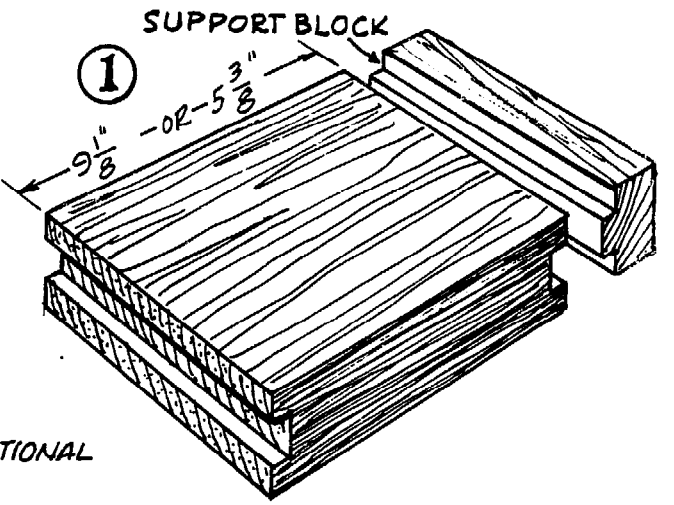
INNER COVER

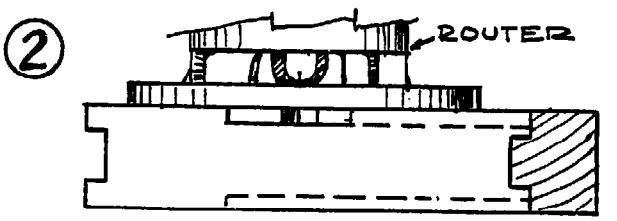


FRAME ENDS.

FULL SIZE PATTERNS



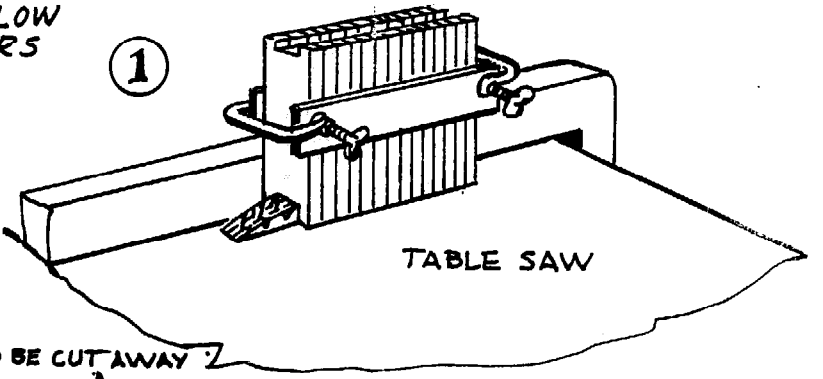


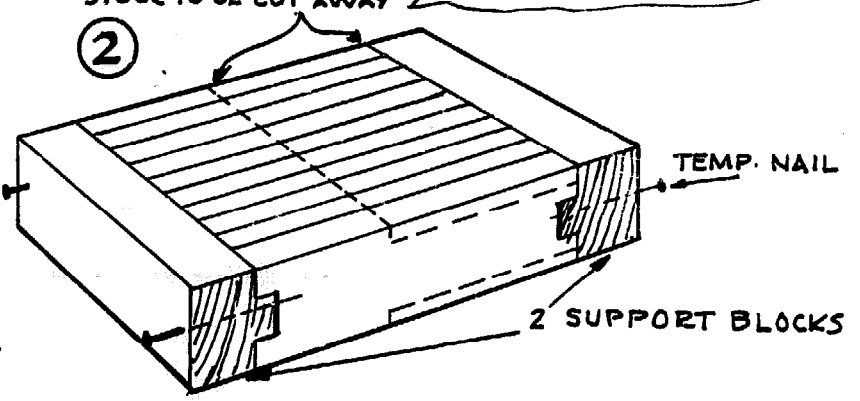


OR USE DADO SAW.

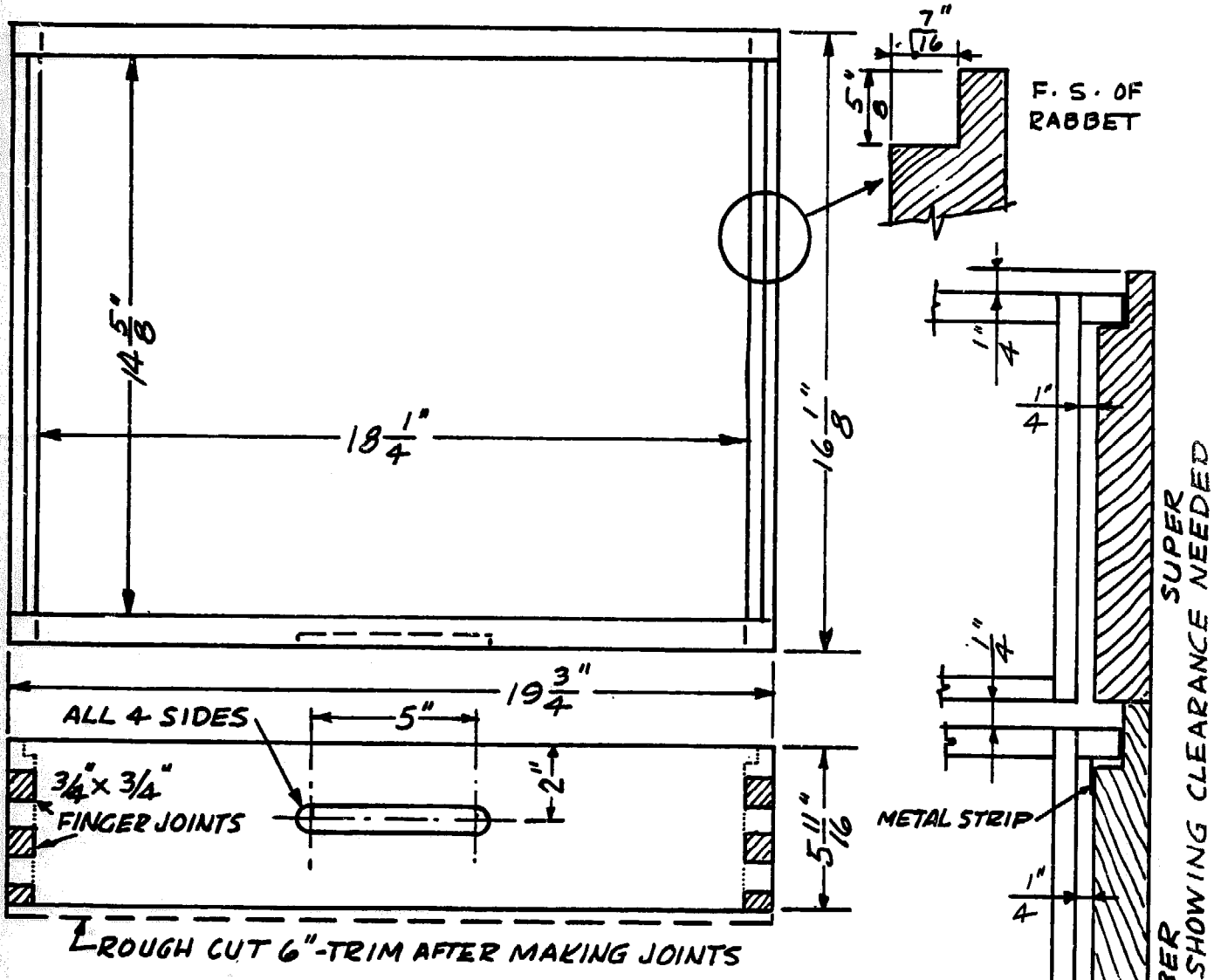
3 SLICE TO 5/16" THICK

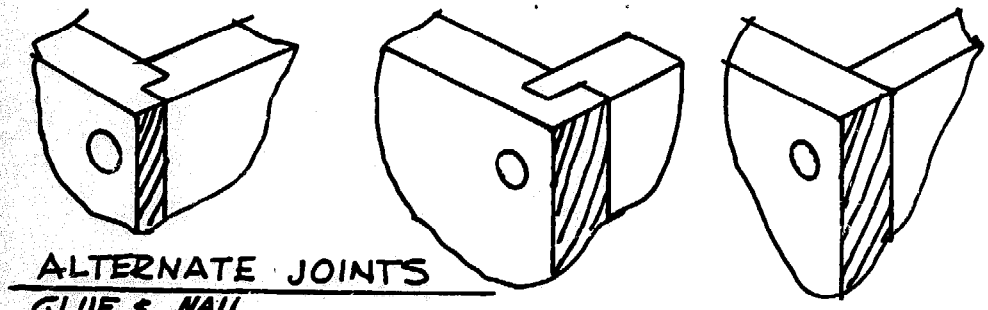
ALT. RIP TO 5/16" THICK. CUT TO LENGTH.



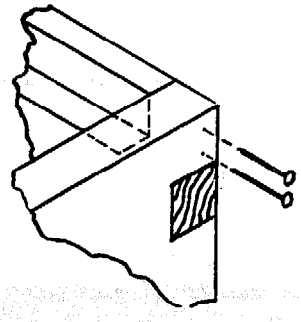


SHALLOW SUPER



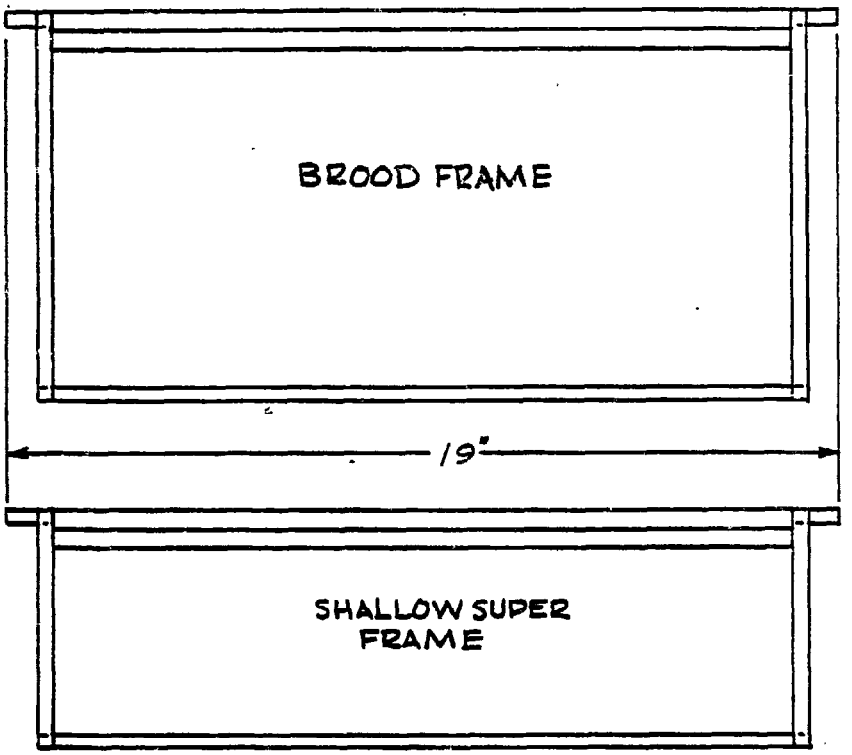


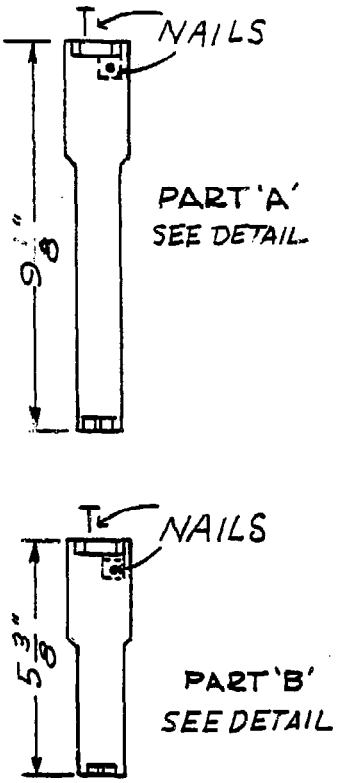
ALTERNATE JOINTS
GLUE & NAIL

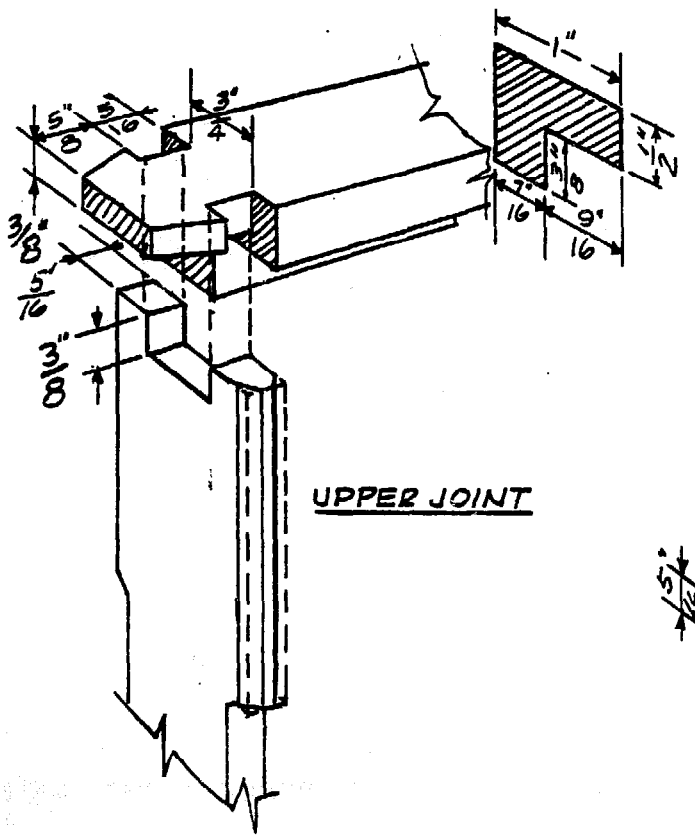


BROOD CHAMBER: When assembling the brood chamber, be sure to nail the rabbeted area as shown in the sketch at right with two very fine 1½" wire nails. The thin section in the rabbeted ends gets a lot of hard usage, and must be reinforced this way to keep it from breaking.

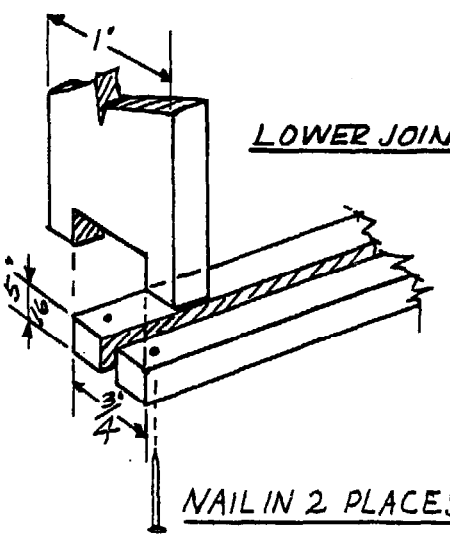
FRAMES







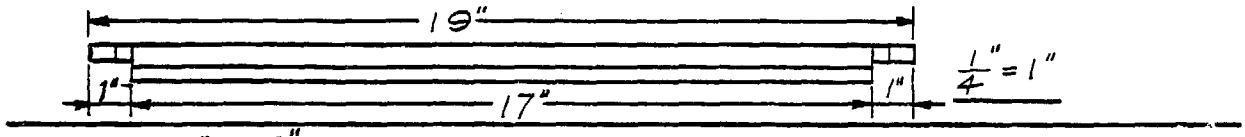
UPPER JOINT

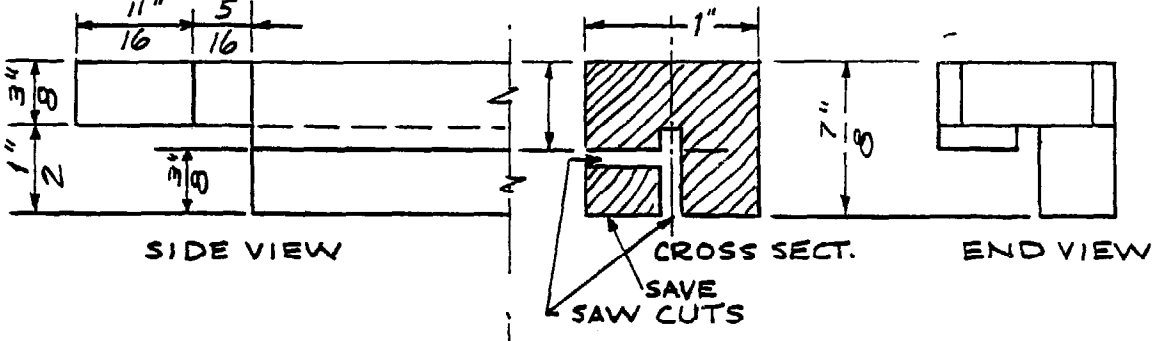


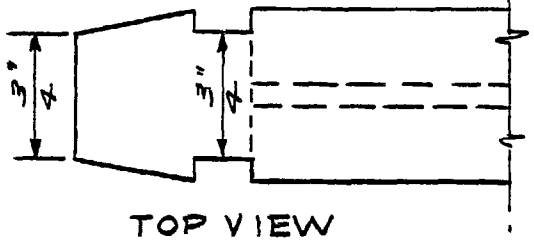
LOWER JOINT

NAIL IN 2 PLACES EACH END

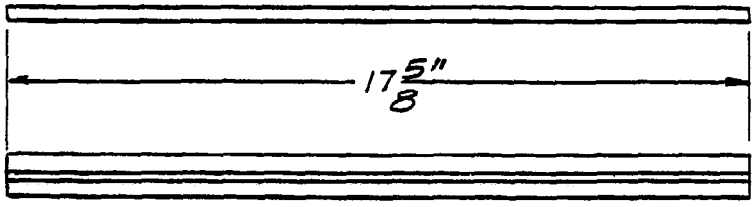
FRAME - TOP & BOTTOM



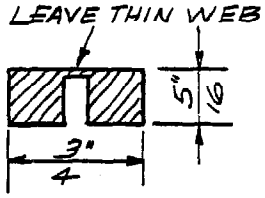




FULL SIZE DETAIL



1/4" = 1"



CROSS SECTION
FULL SIZE

HONEY EXTRACTOR INSTRUCTIONS

This Honey Extractor is designed to fit a standard, 20 gallon hot dipped galvanized trash can. Drill or cut a hole as close to the bottom of the can as possible, and solder a pipe nipple in place; this is the honey drain. Check the can for water leaks. Resolder joints if necessary.

Hardware needed: 1/2" diameter threaded rod, or threaded both ends approximately 3", x 26" long; 6-1/2" hex nuts; 4-1/2" washers; 2-1/2" I.D. ball bearings; 2-1/4" x 2" carriage bolts with wing-nuts; a sheet of perforated aluminum 19" x 32" (available at most hardware stores in 24" x 36" sheets), or galvanized hardware cloth. All wood is to be hardwood; all wood to wood joints should be glued with waterproof glue.

STEP 1: (Refer to Figures 2 and 3.)

The top and bottom frames are made of 3/4" x 3/4" hardwood strips, with half lapped joints, glued and screwed. Bend the perforated sheet to fit inside these frames. (Bend the perforated metal over the square edge of a table or bench.) Fasten the perforated metal inside the frames with 5/8" sheet metal screws. Screw a round head screw, approximately 1 1/2" long, into each inside face of the 3/4" x 3/4" hardwood strip. This will provide a support for the frames when they are placed in the basket. The lower frame bottom is covered with plastic window screen fastened along the edges of the lower frame with 3/4" x 1/4" wood strips and 5/8" screws. The open side of the perforated metal or hardware cloth (where the two ends join) should be "laced" together with wire loops. The two hardwood center blocks, 3/4" x 2 1/2" x 11 1/2" are drilled with a 1/2" hole in the center, and screwed and glued across the center of the frames.

Four air deflectors (cut from aluminum or from plastic rain gutter) are screwed to the leading edge of each side of the frame. These deflectors will direct the flow of the air and honey downward and help keep the honey from flying out of the extractor.

Slip the rod through the hole in the 2 1/2" wide center blocks and lock in place with double nuts and washers leaving 5/8" of the rod projecting below the bottom 1/2" hex nut. This 5/8" projection will slip into the bearing installed in the next step.

STEP 2: (Refer to Figure 3.)

The bottom bearing block is now drilled to take the bearing. The bearing may be a metal sleeve or ball bearing. If you use a metal sleeve, it should be just large enough to slip over the end of the threaded rod. If you prefer, epoxy a tight fitting sleeve over the threaded rod, and epoxy another larger sleeve in the bearing block to act as the bearing. Ball bearings with a 1/2" I.D. are available at most industrial supply companies. A sealed bearing is preferred. After the bearing is installed in the bearing block, center the block in the bottom of the can, and epoxy in place. It is very important that the bearing block be centered.

STEP 3:

The top support (29" long x 2 1/2" x 3/4") is drilled according to Figure 2. Drill the center bearing hole 12" from one end. Cut the two 1/4" x 2" slots, starting 10" from the center bearing hole. The two blocks with the 3/8" x 3/8" notch and the carriage bolts will be used to clamp the top support to the top of the can; the notch will clamp around the lip of the can. Install a bearing in this top support in the same manner as the bottom bearing block.

STEP 4:

The power source can be a variable speed drill, fitted with a 3/4" hex socket to fit two 1/2" nuts locked to the top end of the threaded rod, or a hand pulley system can be set up using pulleys and a V-belt.

If you do decide to use the hand drive, you"ll need the following hardware:

1 - 8" V-belt pulley with 1/2" bore(this may be a solid disc pulley or spoked)
1 - 2" V-belt pulley with 1/2" bore
1 - 4" x 1/2" bolt with 2 nuts
1 - 6" x 1/2" bolt with 2 nuts
6-8 - 1/2" washers
1 - 1/2" lock washer
1 - 3 1/2" x 1" dowel drilled with a 1/2" hole
1 - V-belt approximately 31" long
2 - 1" wood screws

Note: Steps 5 through 8 are only for a hand powered extractor. If you decide to use a variable speed drill, lock 2 - 1/2" nuts on the threaded rod, and skip to Step 9.

STEP 5:

Cut a 1/2" x 2" slot in the top support. One end of this slot is 6 1/2" from the center of the long threaded rod; the other is 8 1/2" (this slot allows for adjustment of belt tension).

STEP: 6:

Cut two pieces of hardwood to fit the curvature of the inside rim of the 8" pulley. Notch the hardwood so that it will "saddle" two of the spokes of the pulley. Place the two pieces of hardwood over the spokes and screw together with two wood screws. (if a solid disc pulley is used, you may eliminate these blocks--however, you'll need to drill a 1/2" hole in the pulley for the purpose of installing the handle.) Drill the hardwood blocks with a 1/2" drill and assemble the handle in place. The handle should move freely on the handle shaft (the 6" x 1/2" bolt.)

STEP 7:

Place a flat washer on the 4" x 1/2" bolt and slip this bolt into the hub of the 8" pulley. Stack enough washers on the bolt so that the handle shaft will clear the top support when a 1/2" nut is threaded on the bolt. Place the bolt in the 2" slot with a washer between the nut and wood. Slip another washer over the bolt and lock the entire assembly in place with another nut.

Make sure that the pulley rotates freely on its shaft. Adjust the hex nuts if it doesn't.

STEP 8:

Lock the 2" diameter pulley in place on the long threaded rod by means of two hex nuts and a lock washer. Make sure the two pulleys line up. Install the V-belt and adjust belt tension.

STEP 9:

Seal all of the wooden parts with a good grade of polyurethane varnish, and make sure the varnish is thoroughly dry before using the unit.

STEP 10:

For extracting, clamp the long end of the bearing block to a bench, supporting the bottom of the can on a stool or blocks. Place a bucket under the honey drain to catch the honey. Or, place the can on a stool or low platform and tie it down with elastic load tie-downs or heavy screen door springs hooked to the top support, and preferably to the floor.

Deep (9 1/8") frames will fit each of the two long sides of the basket or one shallow frame will fit each of the four sides.

Some Suggestions About Extracting:

- Make sure the honey is warm - warm honey will extract easier, and you will run less risk of damaging the comb.
- Try to balance the extractor--place equally filled frames opposite each other.
- To keep from damaging the drawn comb, extract approximately half of the honey on one side of the frames, stop the basket, and extract the second side. Reverse the frames once more for complete extraction.
- When you're finished extracting, wash the extractor down with hot water, dry thoroughly and store the unit in a cool dry place. We recommend enclosing the unit in a large plastic bag to keep out insects and dust.

HONEY EXTRACTOR

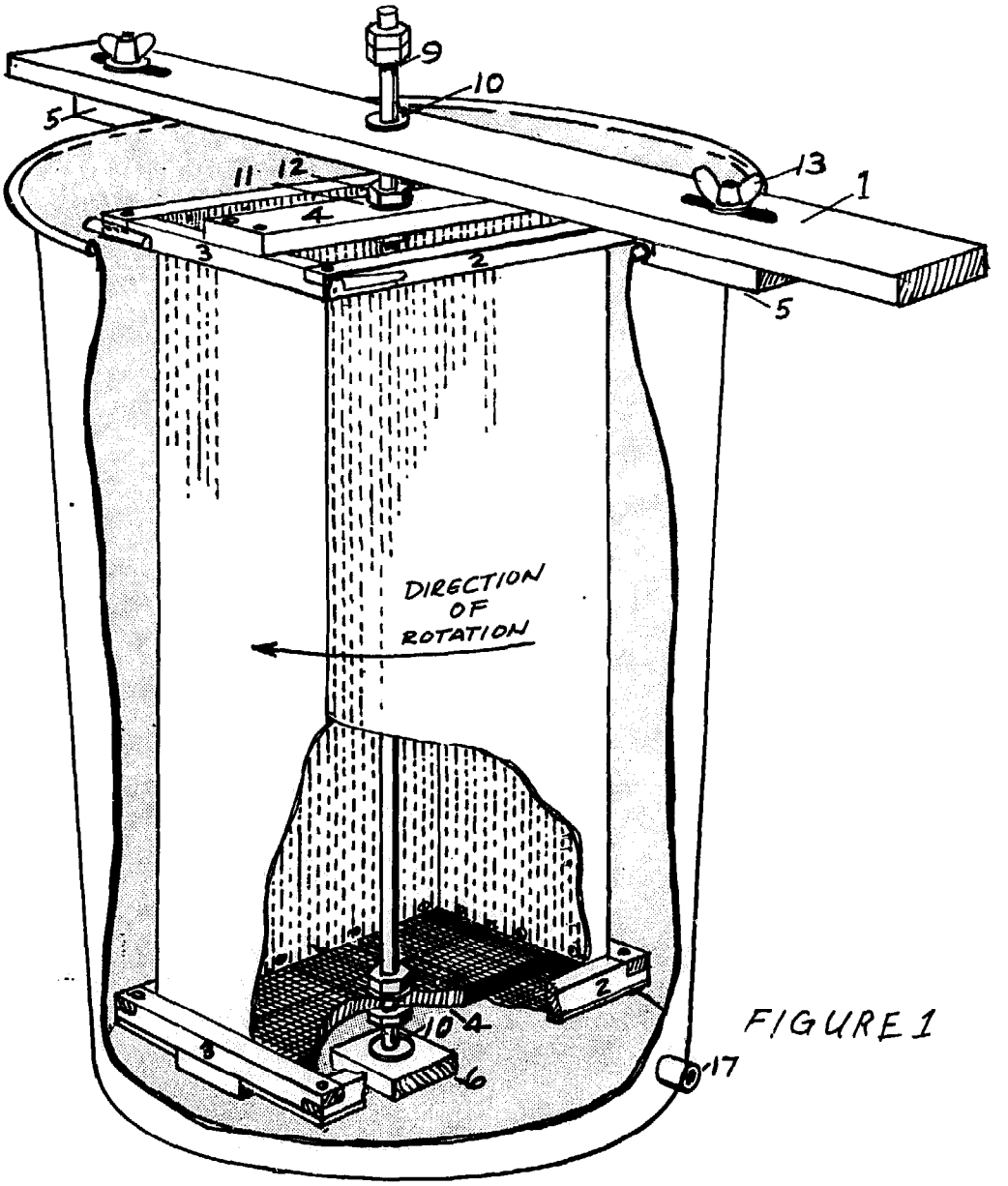
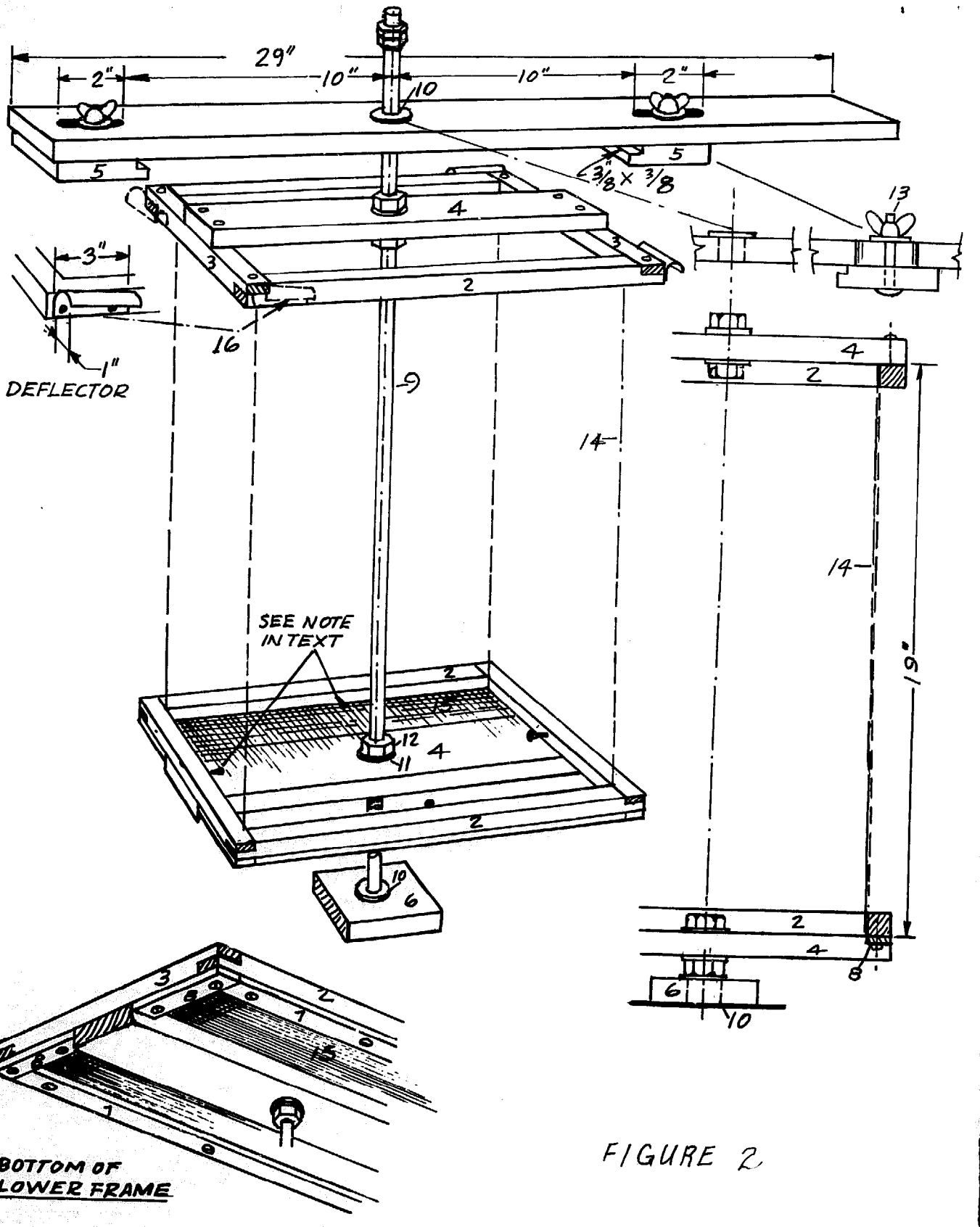


FIGURE 1

BILL OF MATERIALS.

NO.	PART	SIZE	REQ'D	NO.	PART	SIZE	REQ'D
1.	TOP SUPPORT	3/4" x 3 1/2" x 29"	1.	9	SHAFT	1/2" DIA. x 26"	1
2	FRAME SIDE	3/4" x 3/4" x 11 1/2"	4	10	BEARING	1/2" D.	2
3	FRAME END	3/4" x 3/4" x 7 1/2"	4	11	WASHER	1/2" D.	6
4	CENTER BLOCK	3/4" x 2 1/2" x 11 1/2"	2	12	NUT	1/2" D	6
5	CLAMP BLOCK	3/4" x 3 1/2" x 3 1/2"	2	13	CARRIAGE BOLT	1/4" x 2 1/2"	2
6	BEARING BLOCK	3/4" x 3 1/2" x 3 1/2"	1	14	PERF. METAL	19" x 32"	1
7	SCREEN STRIPS	1/4" x 3/4" x 10"	2	15	PLASTIC SCREEN	7 1/2" x 11 1/2"	1
8	SCREEN STRIPS	1/4" x 3/4" x 7 1/2"	4	16	AIR DEFLECTOR	2" x 3"	4
NOTE: ALL ABOVE HARDWOOD.				17	PIPE NIPPLE	3/4" D. x 2"	1



BOTTOM OF LOWER FRAME

FIGURE 2

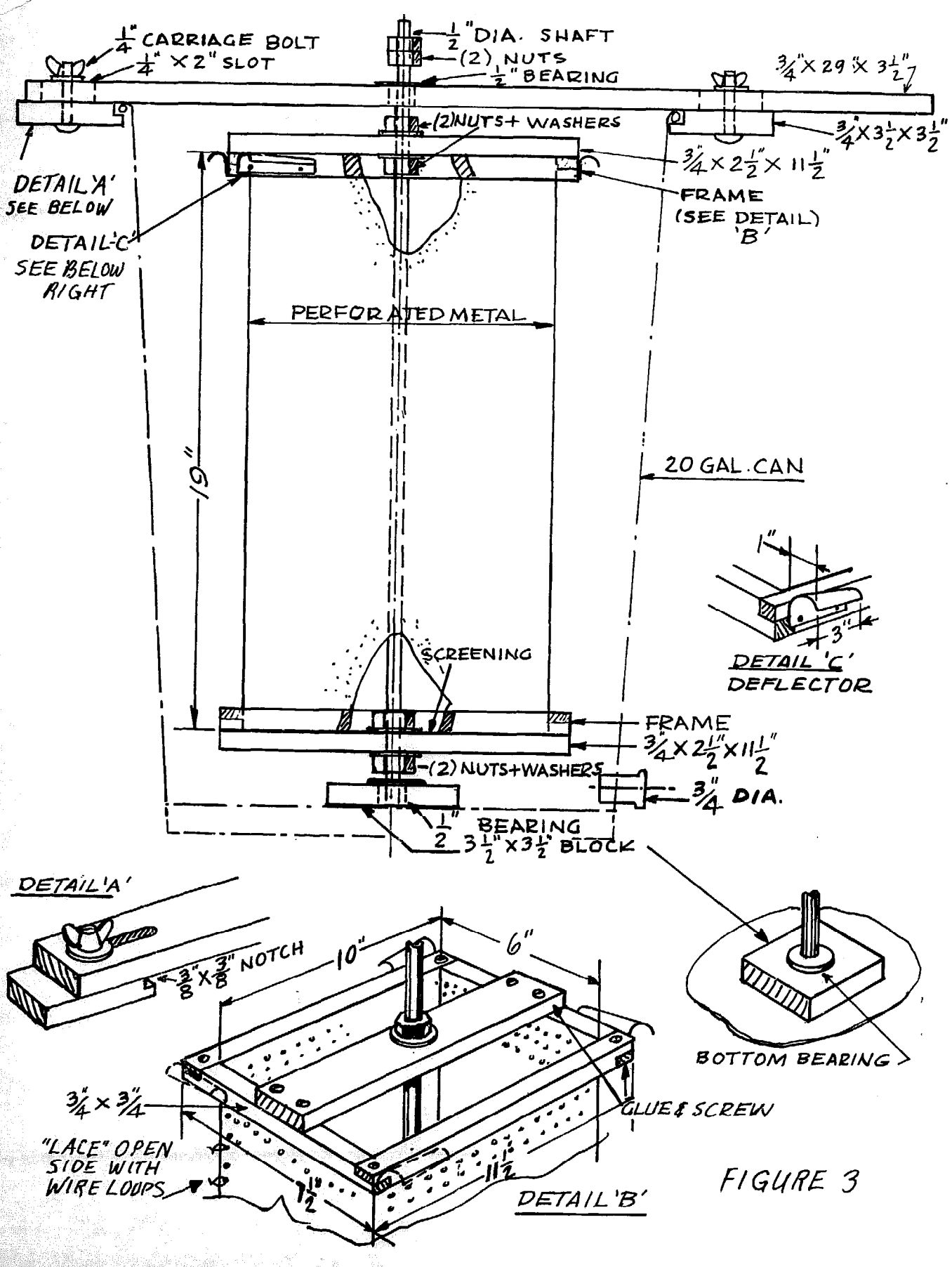

1/4" CARRIAGE BOLT
1/4" X 2" SLOT
1/2" DIA. SHAFT
(2) NUTS
1/2" BEARING
3/4" X 29" X 3 1/2"
(2) NUTS + WASHERS
3/4 X 3 1/2 X 3 1/2"
3/4" X 2 1/2" X 11 1/2"
FRAME
(SEE DETAIL 'B')
DETAIL 'A'
SEE BELOW
DETAIL 'C'
SEE BELOW RIGHT
PERFORATED METAL
19"
20 GAL. CAN
1"
3"
DETAIL 'C'
DEFLECTOR
SCREENING
FRAME
3/4 X 2 1/2" X 11 1/2"
(2) NUTS + WASHERS
3/4" DIA.
1/2" BEARING
3 1/2" X 3 1/2" BLOCK
DETAIL 'A'
3/8" X 3/8" NOTCH
10"
6"
BOTTOM BEARING
3/4" X 3/4"
GLUE & SCREW
"LACE" OPEN SIDE WITH WIRE LOOPS
1 1/2"
11 1/2"
DETAIL 'B'

FIGURE 3

HAND DRIVE FOR EXTRACTOR

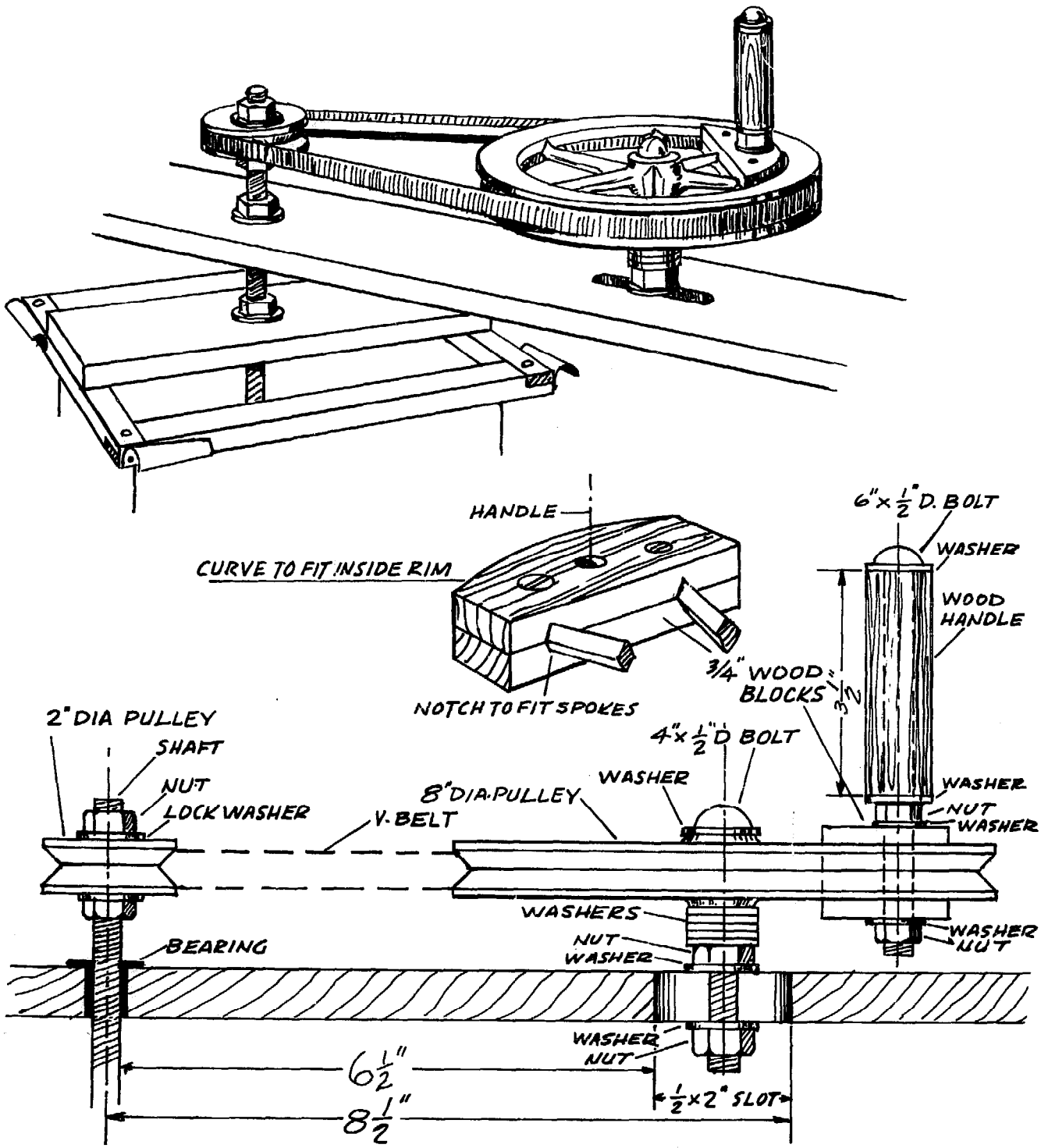


FIGURE 4